UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/743,970	12/23/2003	Gino Tanghe	920522-95345	9404

23644 7590 11/17/2009

BARNES & THORNBURG LLP
P.O. BOX 2786
CHICAGO, IL 60690-2786

EXAMINER	
HOLTON, STEVEN E	

ART UNIT	PAPER NUMBER
2629	

NOTIFICATION DATE	DELIVERY MODE
11/17/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

Patent-ch@btlaw.com

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/743,970
Filing Date: December 23, 2003
Appellant(s): TANGHE ET AL.

William M. Lee, Jr.
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 8/10/2009 appealing from the Office action mailed 12/4/2008 and Advisory Action mailed 5/4/2009.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,020,868	Greene et al.	9-2001
5,396,257	Someya et al.	3-1995

7,161,566	Cok et al.	1-2007
7,184,067	Miller et al.	2-2007

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

Claims 1-10, 15-18, 20, and 23-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Greene et al. (USPN: 6020868), hereinafter Greene, in view of Someya (USPN: 5396257), and further in view of Cok et al. (USPN: 7161566), hereinafter Cok.

Regarding claims 1 and 24, which are drawn to a method of operation and associated display device, Greene discloses a tiled display with flat panel displays making up the tiles (Fig. 2, col. 4, lines 48-52). Green discloses the flat panel displays are known using many different types of technologies including liquid crystal displays, plasma displays, and electroluminescent displays (col. 1, lines 17-24). Greene further discusses a method of matching the visual output of the flat panel display device using correction data stored in memory devices for application to signals to be displayed.

However, Greene does not expressly disclose a method of matching color of a tiled display including "for each of the first subdivisions, setting the emissive devices so that each of said first subdivisions is optimized with respect to a first subdivision target value for that first subdivision, and after setting the emissive devices, for the emissive display, setting the first subdivision so that said emissive display is optimized with

respect to an emissive display target value for said emissive display." Also, Greene does not expressly disclose initial and periodic calibrations of the display system.

Someya discloses a method of matching the output of a tiled display device in which each display device is set to optimize the display of the individual display device and then matching the corrected individual display devices to completely match the tiled display device (col. 4, lines 37-59).

At the time of invention it would have been obvious to one of ordinary skill in the art to combine the teachings of Greene and Someya to produce a method of controlling a tiled display device for correcting the output of the display device. The tiled display device of Greene which uses a flat panel display could be done using any of the well-known types of flat panel display such as an electroluminescent display. Such an electroluminescent display devices is comprised of individual pixels and sub-pixels for emitting light to make up a displayed image. The method of tile display matching described by Someya could be applied to the electroluminescent tiled display of Greene so that first each electroluminescent display would be corrected so that pixels within the displays would match similar to matching the entire CRT face of Someya, and then multiple electroluminescent displays would be matched to each other. The motivation would be to produce a tiled display device with reduced luminance shading and color shading between the plurality of display units (Someya; col. 2, lines 39-42).

However, the combination of Greene and Someya do not expressly disclose initial and periodic calibration of the display system.

Cok discloses a method of adjusting an emissive display system using both an initial calibration of the display device (Fig. 3, steps 30-35) and performing periodic calibrations (Fig. 3, steps 44-56; col. 6, lines 16-21) after the initial calibration of the display device.

At time of invention it would have been obvious to one of ordinary skill in the art to combine the teachings of Greene, Someya, and Cok. The calibration and data matching of the Greene and Someya systems could be combined with the periodic calibration method of Cok. The rationale would be that aging of emissive elements or other operation parameters known to effect the display device could be taken into consideration as part of the calibration of the display device. Thus, it would have been obvious to combine the teachings of Greene, Someya, and Cok to produce a method and device as described in claims 1 and 24.

Regarding claims 2 and 25, Someya does not expressly disclose dividing the tiled display into larger groupings of tiles so that each larger set of displays are matched to each other. Greene discusses the idea of sub-dividing a display into smaller groups, measuring each group, and the matching the different groups with one another to produce a final correction measurement (col. 7, lines 17-39).

At the time of invention it would have been obvious to one of ordinary skill in the art that the correction of a smaller area and then matching the smaller area with other small areas to produce a corrected larger area could be performed with multiple layers of subdivisions. The rationale would be to scale a method of correction of multiple display elements for larger and larger groups of display elements. It would be logically

obvious that a sub-division of a display could be corrected and then matched to other elements within the display to form a larger sub-area. Then larger sub-areas could be corrected and matched to other sub-areas and so on. Such a method could be performed by using the suggested steps of Greene for subdividing an individual display into smaller regions for individual correction to correct the entire display. Then, the method of Someya of taking a corrected display and matching it with other corrected displays would produce a corrected tile of multiple display devices. This method could be later extended to larger groups of display devices or to smaller sub-divided areas of pixels. Thus, it would have been obvious to one of ordinary skill in the art that the methods of matching sub-areas described by Someya and Greene could be extended to include multiple iterations of matching areas, then a sets of areas, and then matching sets of sets of areas to produce the method and device described in the claims.

Regarding claim 3, neither Someya nor Greene expressly discloses providing further subdivisions made up of second subdivisions made up of first subdivisions. However, similar to claim 2, it would have been obvious to one of ordinary skill in the art that multiple subdivisions could be mated together, and then matched sets of subdivisions could be matched with other sets. And the matching of sets could be extended to larger and larger groupings to generate a large tiled display with matched display outputs. Thus, it would have been obvious to one of ordinary skill in the art that the method of first matching a smaller area of elements and then matching multiple smaller areas as described by Someya could be extended so that groups of matched

smaller areas could be matched with other groups to produce a larger matched group of groups.

Regarding claim 4, Greene discloses the first subdivision of a tiled display is an emissive display (Fig. 2; col. 4, lines 48-52).

Regarding claims 5 and 6, as discussed with regarding claims 2 and 3, it would have been obvious that multiple corrected displays could be grouped together and corrected with each other. The group of individual displays would be a display tile. Further, correcting multiple tiles of individual displays would result in creating a corrected group of groups, or a supertile of displays.

Regarding claims 7 and 8, Someya discloses causing the display devices to be changed to a uniform level (col. 5, lines 18-37). Uniform would embody the 10%, 5%, and .8% levels of matching the displays discussed in the claims.

Regarding claims 9 and 10, Someya discloses matching display devices to a uniform level (col. 5, lines 18-37). It would be obvious larger and larger groups of display devices together as tiles and supertiles would also be matched to the uniform level. Thus, it would have been obvious to continue to match the output of larger and larger groups of display devices to uniform levels including 10%, 5%, and 0.8%.

Regarding claim 15, Cok discloses a method of adjusting and correcting the output of an electroluminescent display device based on the measurement of the age of the display device (abstract; col. 7, lines 18-26).

Regarding claim 16, Cok discloses changing operating parameters of a display device based on the age of the display device (col. 7, lines 18-26).

Regarding claim 17, Someya discloses adjusting a control parameter of the display device (col. 4, lines 37-59). Someya discloses adjusting the image data used to control the display device. Thus, the image data and the parameters of the image data such as brightness, gamma, and contrast are used to control the display device to produce an image for viewing. Thus, Someya discloses adjusting the control parameters of the image data to produce a desired output of the display device.

Regarding claim 18, Someya discloses using the computer device to perform all corrections for each tile and across all of the tiles. The use of an algorithm that can be used for both types of calculations would be obvious to one skilled in the art as useful programming and would be a matter of design choice based on the speed of algorithms available vs. the amount of computer processing power and memory available for the entire system.

Regarding claim 20, Someya discloses matching the brightness of the display (col. 4, lines 44-59) and the color of the display (col. 6, lines 1-8).

Regarding claim 26, the Examiner notes that Someya performs the steps of the action on a computer. At the time of invention it would have been obvious to one of ordinary skill in the art that the computer program to run the method could be stored on a standard computer readable medium such as a hard-drive, CD-ROM, or other well known type of storage device.

Regarding claim 23, the Examiner takes Official Notice that it is well known in the art of computing that computer programs can be transmitted across telecommunications networks to be performed at different computer locations.

Claims 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Greene in view of Someya and in view of Cok as applied to claim 3 above, and further in view of Miller et al. (USPN: 7184067), hereinafter Miller.

Regarding claim 11, the combination of Greene, Someya, and Cok disclose all of the limitations except, " wherein determining any or more of the first subdivision target value, second subdivision target value, the further subdivision target value and/or emissive display target value, an environmental parameter is take into account."

Miller discloses an electroluminescent display device (Fig. 3, element 28) where the operating parameters of the display device are modified by measuring an environmental parameter of the conditions outside of the display device (col. 8, lines 26-43).

At the time of invention it would have been obvious to one or ordinary skill in the art to combine the teachings of Greene, Someya, Cok, and Miller to produce a tiled display device with correction for environmental parameters. It would have been obvious to combine the tiled electroluminescent display of Greene, Someya, and Cok with the ambient light measurement system described by Miller. The motivation would be to adjust the brightness of the display device based on the ambient light to improve the power consumption and lifespan of an organic electroluminescent display device (Miller, col. 10, lines 9-12). Thus, it would have been obvious to combine the teachings of Greene, Someya, Cok, and Miller to produce a method of operating a tiled display with environmental measurement as described in claim 11.

Regarding claim 12, Miller discloses measuring the temperature of a display device for modification of the output of the display device (col. 10, lines 20-22).

Regarding claim 13, Miller discloses that the temperature sensor can be inside the display device and outside the display device (col. 10, lines 20-22). A temperature sensor placed near a display device can only measure the ambient temperature surrounding the display device which is affected by the display device. Thus, by measuring the temperature outside of the display device the temperature of the display device can be estimated based on the measured ambient temperature.

Regarding claim 14, Miller discloses measuring the ambient illumination (col. 8, lines 26-43).

(10) Response to Argument

Regarding the Appellant's arguments on pages 5 and 6:

The Appellant has argued that Greene fails to disclose the concept of setting the emissive devices to be optimized with respect to a first subdivision target.

The Examiner respectfully disagrees and Greene is setting the display devices. The phrase 'setting the emissive devices' is a broad term and contrary to the arguments, does not distinguish setting of the display to be only of parameters of the display and not setting the video data signals or other types of setting that can be performed on individual pixels of a display device. The video data transmitted to the displays sets the output of a pixel of a display and adjustment of the video data as described by Greene further sets the display devices so that the output of the displays

meets a first target value so that all of the displays provide equal brightness and color for all of the displays within a larger tiled display system.

Further, Greene provides a target value based on the fact that Greene sets the display devices to achieve color purity and to correct non-uniformities of the display (abstract). Greene sets the display devices to achieve a tiled display having matched brightness levels across the entire display (col. 4, lines 30-32). The value selected to achieve matching brightness across the entire display is a target value selected so that all of the displays are capable of achieving the same brightness and provides a tiled display with matched colors for improved viewing. Greene is suggesting that having matched colors and brightness across a large tiled display is an optimized solution rather than having a user view an image on a tiled display having discontinuities or other non-uniformities within the display device. Thus, Greene is optimizing the display devices of the tiled display by setting each of the displays to a target value to match the brightness and colors output by all of the displays within the larger tiled display.

Regarding the Appellant's arguments on pages 7-12:

The Appellant has argued various positions regarding the teachings of the Someya reference which is combined with the Greene reference.

The Examiner agrees that Someya discloses a cathode ray tube (CRT) type of display device which commonly only has a single electron gun for generating light across the entire display surface. CRT displays are designed to provide individual pixel elements that are individually activated by the electron gun within the display device.

While Someya cannot teach making individual 'settings' to a device that only controls a single pixel on the display, Someya teaches the concept of setting a display device so that light emitting regions across the entire display device match each other. As described by the Appellant in the paragraph spanning pages 7 and 8, Someya discloses dividing the screen into blocks and using a look up table to adjust image data so that the luminance of each block is matched. At the time of invention it would have been obvious to one of ordinary skill in the art that this matching of regions of a display device as described by Someya could be applied to the display devices of Greene so that regions of the LCD and electroluminescent displays of Greene could be matched with other areas of the display devices.

Similar to the above arguments, the claimed invention recites setting the emissive devices to a target value. The limitations do not rule out setting the video data supplied to the display device as a possible means to achieve a target value of output from the display devices. Further, the independent claims make no limitations on what factors are considered in determining the target value, what the target value represents, or how what parameters should be changed to achieve the target value.

The system of Someya optimizes the output of the display devices by first selecting a target -- setting the displays so that the luminance of the displays matches for all displays in the tiled display. And then determines values using lookup tables and known measurements of the display devices to achieve a target value that is achieved by all of the pixels. The conclusion of the correction techniques of Someya is a tiled display with matched luminance for all elements of the display device. The matching

luminance can be considered an optimized state that is improved over a display having unmatched luminance in different areas of the display device.

The Examiner respectfully disagrees with the Appellant, and feels that the combination of Greene, Someya, and Cok, discloses a tiled display system that first sets pixel elements of individual displays to all achieve a target value, then setting multiple corrected displays so that each of the display devices achieve the same target value. The multiple corrected displays producing a tiled display system where each display element within the tiled display is set to achieve a target value, in this case a matched luminance, brightness, and color for all elements in the tiled display, and further performing initial and periodic corrections of the settings of the displays to maintain the matched state.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Steven E Holton /Steven E Holton/

Examiner, Art Unit 2629

Conferees:

/Bipin Shalwala/

Supervisory Patent Examiner, Art Unit 2629

/Amare Mengistu/

Supervisory Patent Examiner, Art Unit 2629